

20 TIPS ON...

Using Microphones

Sound Advice

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It doesn't matter how good the microphone, put it in the wrong place and you might as well be using cocoa tins and string. Hugh Robjohns shares some of his top tips...

If your music involves acoustic instruments or voices, the ultimate quality of your recordings depends entirely on your microphones and what you do with them. The good news is that a well-positioned cheap and cheerful mic can often outperform a poorly-positioned thousand-pound microphone. Also, how you look after your mics, and how you rig your studio, can make a lot of difference to the smooth running of the session. Looking after your mics and positioning them carefully is the key to capturing great sounds.



1. Some microphones have very characteristic 'sounds' -- presence boosts, very full bass or whatever. These characteristics can be helpful in specific applications, but generally restrict what you can do with the microphone. Better to choose a very neutral-sounding mic, and use positioning (or equalisation if you must) to create the necessary sound character.

2. Capacitor and electret mics don't like dust, smoke or humidity, all of which will affect the sound quality whilst in that environment and, in the case of dust and smoke, progressively and permanently degrade the microphone diaphragm. Decent mics are expensive so it pays to look after your investments. If you suspect the performance of your microphone is not as good as it once was, consider returning the mic to the manufacturer or a specialist company for servicing and to have the diaphragm cleaned.

3. Always handle mics with care -- not style! Put them away when not in use, don't drop them, and never slam the lid on their boxes or you could split the diaphragm. Ideally, keep your microphones in a closed foam-lined box after use and store them somewhere warm and dry. If you don't want to keep packing and unpacking your mics, do as many professionals do and leave your mics on stands at the side of the studio with appropriately-sized freezer bags over them to keep the dust out. The pros also leave them

plugged in to the console at all times, so that they are phantom powered and therefore stay warm, thereby avoiding humidity problems.

4. Dynamic mics tend to have less dynamic ability, with a 'softer' top end, than capacitor or electret mics, but are far more capable of taking abuse from loud instruments or rough handling. So in applications where a 'warmer' or 'fatter' sound is required (eg. on drums or a thin-sounding vocalist), or in front of very loud sources, a dynamic mic is often a good choice.

5. Capacitor and electret mics tend to be more sensitive, sound 'faster' and generally more neutral, and so make a good choice when you are trying to capture subtle nuances in a sound. Small-diaphragm capacitor mics are generally more neutral and accurate than large-diaphragm mics, which generally tend to exhibit a warmer and fuller nature.

6. Electret mics can often be powered either by an internal battery or phantom power. Given the choice, phantom is the preferred way to power the mic, firstly because it avoids the problem of a battery running flat part way through the best take, and secondly because the head-amp inside the microphone will have more headroom and less noise. If your mic must be powered by a battery, remove it when not in use, so that the battery contacts are wiped clean by the action of inserting and removing the battery. The mic draws such a small current that any corrosion on the terminals could degrade the performance of the head-amplifier. Allow electret and capacitor mics to warm up for a few minutes before any critical listening.

7. And talking of head-amplifiers inside capacitor and electret microphones, these are generally designed to cope with a 'normal' range of sound pressure levels. If you place the microphone very close to a loud sound source, this head-amp can easily be overloaded, producing distorted sound.

Many capacitor mics either have switchable attenuators or special attenuating modules which can be inserted between the capsule and preamp body. If in doubt, use the attenuator -- better low level, which can be corrected at the console, than a distorted sound, which cannot!

8. Don't forget to shut the faders on the console or to mute the speakers when you reposition microphones, re-plug, or switch phantom or battery power on to them. Anyone waiting in the control room while you sort out the studio will be very unimpressed (not to mention deafened) by the thumps, pops and bangs, and it can be very embarrassing on your return to find the charred

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remains of the woofer cones hanging out of the monitor speakers!

9. When adjusting the position of a microphone on a boom stand, never force the clamps, because they will quickly lose their ability to hold position. Better to loosen all the clamps, allowing complete freedom of movement to position the mic exactly where you want it. Then tighten everything up again, starting at the column, followed by the knuckle and boom arm. If your stands are in good condition, you won't need the strength of a gorilla -- just a firm twist will be sufficient to make sure the stands don't start drooping halfway through the session.

10. Possibly the most important thing to remember about using a boom stand is to ensure that one of the three legs is positioned directly below the arm. This guarantees that it will be stable and prevents it from toppling under the weight of a heavy mic. You can make life much easier for yourself if you don't wrap the mic cable around the stand like a boa constrictor. A single turn up the vertical part of the stand, and another along the boom is quite sufficient to look neat and tidy whilst making it much easier to adjust the stand should you need to reposition the mic. Coiling the spare cable under the mic stand allows the stand to be moved to a new location easily, and makes it much easier to trace cables back to the connector panel on the wall or multicore breakout box if you need to re-plug or replace a faulty cable.

11. It is important to isolate microphones from physical shock (especially omnidirectional mics) as subsonic and low-frequency noise will reduce headroom significantly. Be aware that few nearfield monitors are capable of revealing what is going on below about 60Hz, so if you see peaks on your meters which don't seem to correspond to the sound, suspect LF rumbles -- often from a tapping foot! Ideally, isolate the mics with purpose-designed shockmounts, but placing each leg of a microphone stand on dense foam pads can help a lot too.

12. The usual reason for using any kind of directional mic is to gain separation from an unwanted sound source. Remember this when placing the mic, because what you aim the thing away from is far more important than what you point it at. Think about the polar response in three dimensions and position the mic so that the unwanted sound approaches its least sensitive angles. These are directly behind on a cardioid, to the sides on a figure-of-eight, and on the edges of a rear-facing cone for a hypercardioid.

13. At a given price, an omnidirectional microphone often has a more neutral sound and a more extended bass response than a directional one. However, because it has no ability to discriminate against unwanted sound sources, it must be positioned at less than around half the distance of any directional mic for the same amount of spill or room sound. So if you are happy to close-mike a source, don't discount using an omni, which will often sound less coloured than a cardioid, for the spill penalty will probably be negligible. Don't forget that many (cheaper) omnis tend to become quite directional at high frequencies, so try to keep the main sound source on-axis.

14. All directional mics exhibit some degree of proximity effect (bass boosting, which becomes stronger the closer the mic is to the source). This can be used to advantage if you want to warm up a sound in a more natural way than with EQ, but beware putting mics close to a moving source, because the character of the sound will vary as they move. Dancing vocalists and swinging guitarists are often uncontrollable!

15. The ultimate quality of your recording is partly dependent on the quality of your microphones. Following the principle of rubbish in, rubbish out, the better your mics, the more accurate your recordings can potentially be, and the more subtle detail they will contain. Top-quality professional mics typically cost between £500 and £1000 -- which adds up to a significant proportion of most project and home studio budgets. Pros might use ADATs and 02Rs too, but a key reason for the high quality of their recordings is the quality of their mics....

16. Where you place the mic is the single most important and creative aspect of recording music. Take the time to experiment and the care to get it right. I can never stress enough how important it is to go into the studio and listen to the sound source from all directions before thinking about how, and from what angle and distance, to best capture that sound with a microphone. Moving a microphone as little as an inch can radically alter the sound it captures. Getting the mics in the right places doesn't guarantee a great recording, but get them wrong and you'll never achieve that nirvana.

Bonus Tips On Drum Miking!

- Positioning a bass drum mic can be awkward on a stand, and if the kit creeps across the floor it make come into contact with the stand introducing mechanical shock into the mic. Instead, if the front skin has a hole, try laying a mic on cushion inside the drum, but experiment with positioning fore and aft, and side to side, to get a good sound with the right combination of body and beater click. If an individual drum sounds great when solo'd but poor when the other mics around the kit are faded up, this could be down to phasing problems; try reversing the phase of the nearby microphones. This can be particularly important when combining mics above and below the snare, for example.
- For a rock drum sound, try balancing the close mics first and add the overheads to improve the clarity of the cymbals. For a live or jazz drum sound, use the overheads for the main balance and add close mics for a little extra focus. In both cases, take care to match the panning of the close mics to their stereo positions defined by the overheads.

17. Always try repositioning or replacing a microphone before reaching for the equaliser. It might take a little longer, but the results are superior. Equalisation is intended for creative modification of a sound, not for creating it -- that is what you choose and position mics for! Reducing spill by thinking about the positioning of the mic and the appropriate selection of polar patterns while you are rigging is

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actually far quicker than having to set up noise gates. It also sounds much better, and is usually more effective and reliable. Don't forget that you can often minimise spill at source by thinking about how to position the instruments in the studio, so that unwanted sounds always arrive on the dead axes of the microphones (see tip 12).

18. The best way to check adequate separation between the mics is by listening to each instrument on the mics in front of all the others. The spill should be at least 12dB below the typical level of the mic's own source. If not, reposition the mic, choose a different polar pattern, reposition the instruments, or introduce screening. If that doesn't work, you will have to try EQ or possibly gating! After the session, try to figure out what went wrong and improve on it the next time!

19. If you really are stumped about where to put a mic, a handy rule of thumb is to place it as far away from an acoustic source as the longest dimension of that source. So in the case of an upright bass, for example, try to locate a good-sounding positioning about four feet away. Most acoustic instruments need space for all elements of their sound to gel and take on their correct proportions. Miking too close will tend to emphasise the mechanical noises of fingering, bowing or valve clicks, as well as distorting the balance of the fundamental and harmonics.

20. A common problem when recording vocalists, particularly if they are more familiar with live performance than studio work, is of that they can get much too close to the microphone, causing popping, sibilance, excessive bass boost, and creating humidity problems. Very large foam windshields might help, but a separate pop shield (the nylon stocking on a wire frame idea) mounted four or five inches in front of the mic is better. An alternative technique is to rig a microphone for the vocalist to 'eat' with a second mic positioned something like eight inches further back and six inches higher. Normally you would record only the sound of the distant (normally a decent capacitor mic), but if you rig a conventional live-performance dynamic model as the close mic and mix in some of that mic's signal, you can achieve a more interesting and slightly aggressive sound!

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